

Steppin' out with Flash and Buck



For a little more than five hours earlier this month, the United States had two manned spacecraft in orbit.

One was the approximate dimensions of a DC-9, the other not much larger than the humans it carried. The latter, of course, was the Manned Maneuvering Unit (MMU), the product of 18 years of development work by engineers at JSC and Martin Marietta.

"We had some disappointments, but there were moments of great satisfaction, too."

That statement by 41-B Commander Vance Brand seemed to sum up a mission where two satellites failed to reach high orbit, but where the successful test flights of the new MMU set the stage for space operations through the rest of this century.

For just over five hours, Mission Specialists Bruce McCandless and Robert Stewart tested the MMU design in space, close to the orbiter and at translation distances as far as 300 feet. When asked during an in-flight press conference if they thought of themselves as "Buck Rogers people" during the MMU flights, Stewart said, "Well, I thought of myself as an engineering test pilot evaluating a very high and fast flying machine of a quite unusual design."

"But in the cabin here they've been calling themselves Flash and Buck," Brand said.

Both spacewalkers said the MMU offered freedom and precision of movement heretofore unheard of in extravehicular activity. "It is very precise," Stewart said. "I think you

could fly it to the millimeter if you wanted to."

McCandless, who became the first astronaut to walk in space untethered, said the view offered by flying out from the ship was striking. "I think at some point we need to mount an IMAX camera on the helmet so we could bring back a 180-degree perspective for you of what it looks like out there."

"The panorama of the Earth going by beneath you and the Orbiter hanging there in the distance was magnificent," said Stewart, who is the first Army astronaut ever to fly in space.

Earlier in the week, the failure of the Integrated Rendezvous Target to deploy properly caused a cancellation of planned rendezvous tests with the Orbiter. But one goal of

that test was accomplished indirectly when crew members tracked the partially inflated balloon target with the Shuttle rendezvous radar for over one orbit and were able to resolve it out to 52,000 feet. Preflight estimations had been that the radar's range probably would not exceed 26,000 feet.

In describing the problems with the two communications satellites—WESTAR VI and PALAPA-B2—as "an extreme disappointment," the crewmembers and NASA, were able to find some small solace in the fact that all Shuttle systems and procedures worked perfectly during the deploys. Both satellites are Hughes 376 models with McDonnell Douglas Payload Assist Modules (PAM-D's).

Although it was not known at press time the exact cause of the

satellite problem, McDonnell Douglas said the upper stages "ignited and operated for only a portion of the normal operating time, thus not delivering the required performance to the satellites." McDonnell Douglas has formed a senior review committee to investigate the causes of the failures.

Prior to this flight, both the PAM-D and the STAR 48 motor built by Morton Thiokol had a perfect record of 18 successful firings, including five from the Shuttle and eleven on Delta rockets.

NASA Administrator James M. Beggs said the problem is being viewed as a temporary setback, and expressed a willingness to consider the feasibility of a retrieval mission for the satellites should the customers desire such a review.

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The future takes shape

JSC named lead center as Space Station gets underway

A course for the future is now being set at JSC following the Feb. 15 announcement by NASA Administrator James M. Beggs that JSC will assume lead center responsibilities for the new Space Station Program.

Beggs has requested JSC to form a program office to execute five basic program responsibilities for the Space Station: systems engineering and integration, business management, operations integration, customer integration, and support of the NASA Headquarters Space Station Program Office.

Beggs also requested other NASA center directors to assist in the development of a detailed functional

plan for the new management structure. He also directed Headquarters and other centers to recommend key personnel from their offices to aid in the detailed planning and staffing of the program. Beggs also said he will form a new organization at Headquarters on the level of an associate administrator for the Space Station, and that he plans to make assignments to other NASA centers under overall project management of JSC.

"In the near term," Deputy Director Robert Goetz said, "it means we've been given responsibility for Level B activities with the Space Station. The Office will be located at JSC, staffed by JSC personnel as well as people from other cen-

ters. It will report functionally to Headquarters, therefore it is not a direct line center organization. In that sense it is similar to the way the National Space Transportation Systems Program Office is organized within the Headquarters Office of Space Flight."

"One of the big differences, however, is that the Level B Space Station Office will have complete resource responsibility," Goetz said. "In other words, the office will have responsibility for funds which eventually will get distributed to other centers, as well as to JSC. In addition to the program management, we will also have some Level C responsibilities, which means such things as hardware

development and contract monitoring. And remember, this is essentially a 20 or 30 year program. I'm not sure it has sunk in on all the people around the Center just how important the last few days have been to JSC."

Like the Shuttle Program, the Space Station will be organized on three levels (I, II and III for Shuttle; A, B and C for the Space Station), with phased development over the next decade similar to the Shuttle development program (see chart, page 2).

A major departure from management of prior programs reflects the long-term Space Station commitment. Because it is a multi-decade

program which by definition is intended to evolve, both in added capability and advanced technology, Goetz said NASA will not name a prime contractor, but rather will act as the prime contractor itself. "In effect," Goetz said, "the prime contractor will be NASA, or the U.S. Government, which will award subcontracts to aerospace companies and other contractors, and then integrate those elements. Systems engineering and integration, for example, will primarily be done in-house."

Officials here do not expect the permanent civil service complement to rise appreciably at JSC,

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Bulletin Board

Lunarflins to offer SCUBA course

The JSC SCUBA diving club, the Lunarflins, will offer a six-week basic course beginning March 19. The course will include classroom lectures at the Gilruth Recreation Center and supervised practical experience in the pool. Students who successfully complete the course will be certified by NAUI. Enrollment is limited. The club also schedules regular boat trips to coral reefs, sunken wrecks and platforms in the Gulf, as well as diving vacations in the Caribbean. Interested persons are asked to attend one of the monthly meetings to learn more about the club. For more information on the class, call the Rec Center at x3594.

JSC Users Group to meet March 5

The JSC Users Group invites TI 99/4A owners to the next meeting beginning at 7:30 p.m., March 5 at the Gilruth Recreation Center. The group offers free access for JUG members to over 180 educational, business and game programs for the TI 99/4A. For more information on the meeting or the Users Group, call Richard Galindo at x2975.

Space News Briefs

Active volcanism on Venus suspected

A volcano erupted on Venus in 1978 with at least 10 times the energy of any volcanic eruption on Earth in the last 100 years, scientists now think. The eruption, according to data from the Pioneer Venus probe, far surpassed the 1980 Mount St. Helens explosion and was even more powerful than the 1883 Krakatoa blast which was heard 3,000 miles away and killed some 36,000 people. When Pioneer entered Venusian orbit in 1978, sensors detected a very heavy cloud of sulfuric gas around the planet. The cloud—traced to a massive release of sulfur and other particulates—has since declined dramatically. Scientists at the Ames Research Center said the eruption in 1978 sent sulfur 40 miles high, through an atmosphere 100 times more dense than the Earth's.

NASA 905 refueling tests suspended

In-flight refueling tests on NASA 905, the Shuttle Carrier Aircraft, were suspended earlier this month when buffeting from tanker aircraft produced cracks in the tail of the 747. The cracks are considered minor and the 747 is classified as ready to support any necessary transport of Shuttle Orbiters. Preliminary tests of the refueling technique were conducted at Edwards Air Force Base in early February using a KC-135 and a KC-10, the two types of tankers in the U.S. Air Force inventory. Heavy turbulence encountered in the vortices of the tankers produced the cracks, and NASA officials are now studying another approach. The alternate technique would allow the 747 to fly in front of the tankers during the refueling.

Full-scale crash of 720 scheduled

Sometime this summer a jetliner will descend from 2,000 feet and crash into Rogers Dry Lake at 17 feet per second. After a wheels-up impact, the airplane will slide along the desert floor and then its wing tanks will rupture. No one will be hurt. Those details were not supplied by a psychic seer of the future, but by the Federal Aviation Administration and NASA, who have been conducting aircraft crash tests for over a decade and are now preparing for the most elaborate crash yet. The aircraft to be used in the crash test is a remotely piloted Boeing 720, a four-engined short-haul version of the 707. The plane will be fully instrumented and will carry several sensor-laden dummies to measure impact forces inside as might be experienced by human passengers in a real crash. The test will also examine new antimisting kerosene fuel, fire resistant interior materials and more crash resistant structures.

NSPE cites 10 top achievements

The National Society of Professional Engineers has issued its choice for the 10 outstanding engineering achievements of the last 50 years, four of which are in the aerospace field. The 10 achievements, not necessarily in order of importance, are: the development of nylon; the first controlled, self-sustaining nuclear reaction; the Electronic Numerical Integrator and Calculator (ENIAC); the transistor; the inertial navigational guidance system; the Boeing 707 jetliner; the implantable pacemaker; lasers; the Telstar satellite; and Project Apollo.

U.S. experiments fly successfully on Cosmos

Data and biological materials from the recent Soviet Cosmos 1514 flight are scheduled to be returned to the United States for analysis soon. The Cosmos was launched Dec. 14 from the Soviet Union and recovered successfully five days later after 79 orbits. Scientists from the U.S. participated in studies of 10 pregnant rats and in biorhythm studies of two Rhesus monkeys. The U.S. scientists also were advisors to Soviet cardiovascular experiments on one of the Rhesus monkeys. The experiments were designed to provide information on cardiovascular system changes due to weightlessness, synchronization of the circadian bodily time clock in space, bone calcium metabolism alterations and fetal and post-natal development of rats exposed to spaceflight. Two scientists from the Ames Research Center will travel to Moscow in the near future to collect the data and biological samples. Other U.S. scientists have already been to the USSR, where they conducted post-flight experiments following the recovery of Cosmos 1514.

Ariane to launch INTELSAT March 5

The eighth Ariane launch, now scheduled for March 5 from Kourou, French Guiana, will carry the INTELSAT V F8 satellite for the 108-country International Telecommunications Satellite Organization. It is the second INTELSAT V spacecraft launched by Ariane, according to the European Space Agency. The first was F7, launched Oct. 18 of last year. The INTELSAT system provides telecommunications to a large part of the planet and domestic satellite communications to more than 20 countries, ESA said.

NASA
Lyndon B. Johnson Space Center

Space News Roundup

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Space Station

(Continued from page 1)

although the contractor work force in the area could increase in the long term. "We will bring in people on detail from other centers," Goetz said, "and with Phase B contracts being maintained here, the traffic in and out of Clear Lake will certainly grow. Later in the program, those industries involved with Phase C and D which aren't already here will probably need to be."

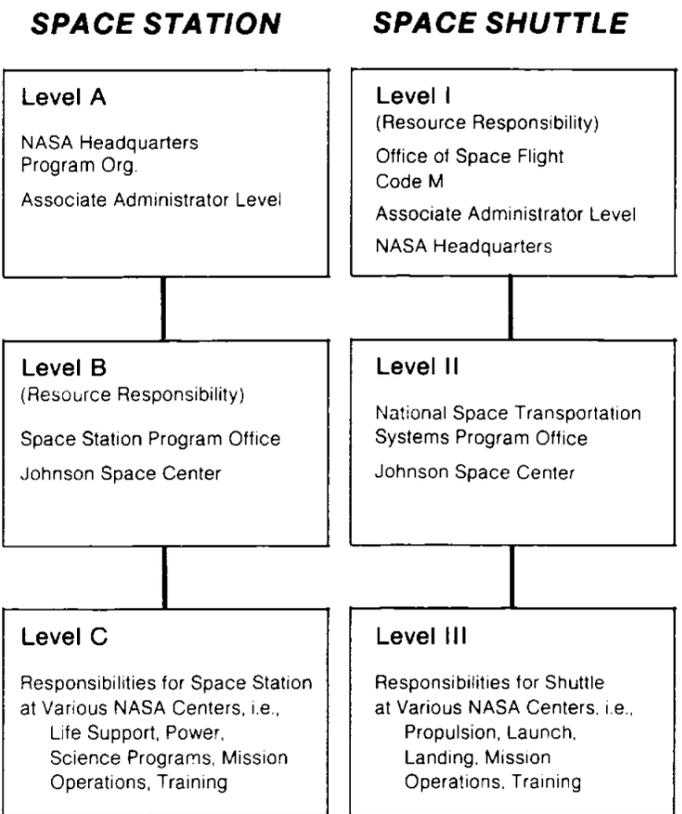
Goetz explained that the organizational plan Beggs requested will be submitted March 15. After that time, it will be approximately another year before definition or Phase B contracts are awarded.

During the same time frame, JSC will be proceeding with its plans for consolidation of its Space Shuttle operational contracts in an effort to make them as efficient as possible. In addition Goetz said, "We're trying to enhance our resources by reducing the cost of flying the Shuttle, as well as freeing up people so that we can take on new things."

"We went back and surveyed some past development programs, and just for systems engineering and integration alone—apart from contract monitoring and administration—there was an enormous number of people at work, somewhere between 1,000 and 2,000. Obviously we cannot devote that kind of manpower. But even if we are talking about 300 to 400 people, and looked at the individual talents needed, you can see one reason why JSC was selected. We do have a talent which covers a broad spectrum of disciplines. We might not be very deep in some areas, but for those cases we will call on the capabilities of the Agency. We'll bring in people from other centers," he said.

Goetz also said the technical challenges involved in the Space Station Program will not be the development of new technology to get the program off the ground, as was the case with the Space Shuttle. "The real challenge will be in building technology transparency or the capability to update functions aboard the station as technology develops. The best example I can think of is environmental control and life support. The cheapest way to do it is state-of-the-art, the way we do it now on the Shuttle. In

Shuttle and Space Station Compared



Space Station Phased Development

Block I:

- Phase A Concept Definition
- Phase B Definition (Specifications for hardware, etc.)
- Phase C & D Construction and launches — for initial capability

Block II:

- Advanced capability and technology development

the case of the Space Station, that means you periodically would bring in water, take out waste, and that sort of thing. But over the long term, the most efficient way is a closed loop system, which utilizes the resources you bring up there initially, and has very little loss and very little need for resupply. But that is a more expensive system to buy initially, while having a lower life cycle cost in the long run.

"So if you can't afford the system

you really want for the long term, you make allowances and design for the eventual replacement of a certain function with a new system downstream."

Goetz said it is not unrealistic to think of the station as a new NASA center being built 200 nautical miles straight up. "We'll be putting a lot of capability right there, 'on-site', so to speak. At some point it will become very comparable to one of NASA's research centers."



The first Shuttle reentry visible from the U.S. was captured in this photo taken near Galveston by Paul Maley of Ford Aerospace.

Steppin' out

(Continued from page 1)

Both satellites are working properly, but are unusable in the low, lopsided orbits they now occupy.

During two spacewalks, McCandless and Stewart also tried out for the first time a Grumman-built device, the Manipulator Foot Restraint. "It proved to be a very convenient and useful work station," said Mission Specialist Ron McNair, who guided the remote manipulator arm around the payload bay with McCandless and

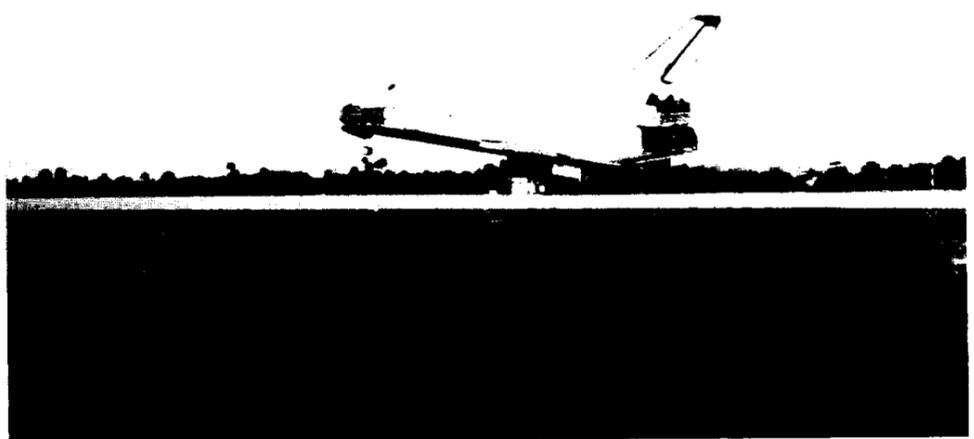
Stewart alternating in the MFR.

During the second EVA, a planned test with the Shuttle Pallet Satellite had to be scrubbed when a malfunction was noticed in the wrist joint of the robot arm. Engineers at the Kennedy Space Center have tried without success to duplicate the failure on the ground. The arm has flown on all previous RMS missions, and was replaced last week with a new flight unit.

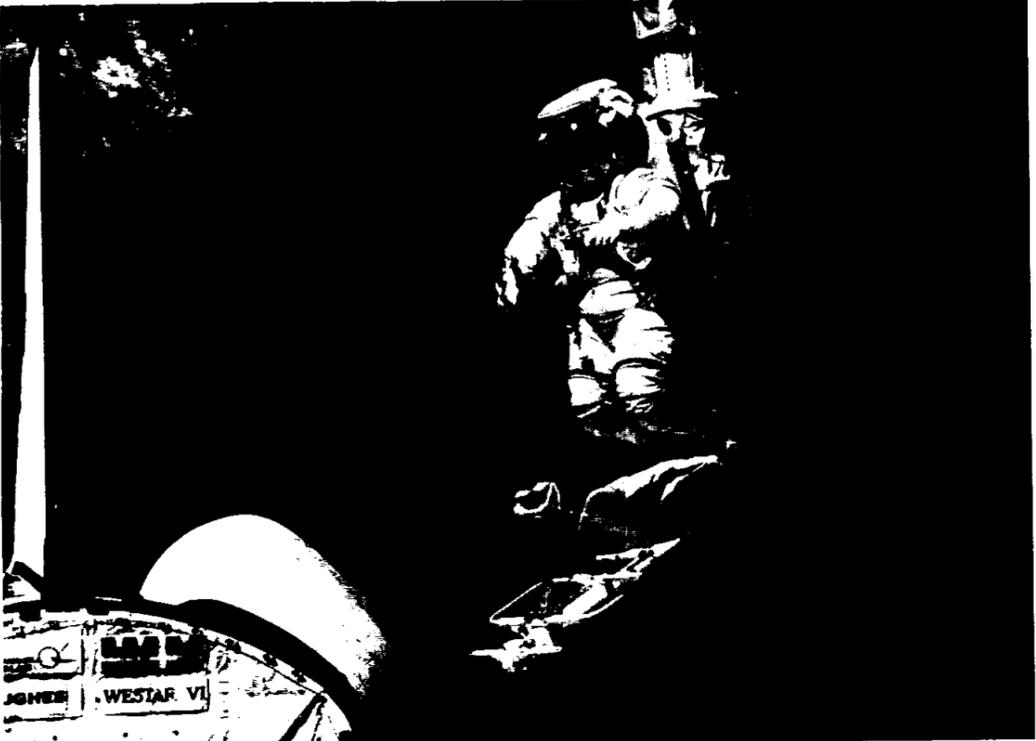
The last major objective of the

flight—a landing at KSC for the first time—was realized on schedule. Brand became the first commander to land at both Edwards Air Force Base and the Cape. Overall, officials at the Cape were pleased with the shape of the vehicle.

The landing came at 6:16 a.m. CST, Feb. 11. By about 1:15 that afternoon, *Challenger* was in Bay 2 of the Orbiter Processing Facility, and was powered down by about 10 p.m. that night.



The photographic record of Flight 41-B includes, at top, this multi-frame representation of the MMU translation out to 300 feet. At right, the Orbiter Challenger as seen by Mission Specialist Bruce McCandless during his translation. Can you find Bob Stewart in this picture? Below left, McCandless takes the Manipulator Foot Restraint through its paces in this photo taken by Pilot Robert "Hoot" Gibson. Below right, Mission Specialist Ron McNair, who counted among his orbital duties the Cinema 360 filmmaking project, dressed for the part. "We knew he really meant business with that getup on," Commander Vance Brand said. The name tag on his uniform reads, "Cecil B. McNair." Above, two photographs which sum up the final day of the flight. At top, the first landing at Kennedy Space Center. Below, proud fathers Gibson, McNair and Brand with their sons Paul, Reggie and Erik after the crew arrival in Houston.



Roundup Swap Shop

Ads must be under 20 words total per person, double spaced, and typed or printed. Deadline for submitting or cancelling ads is 5 p.m. the first Wednesday after publication. Send ads to AP 3 Roundup, or deliver them to the Newsroom, Building 2 annex. No phone-in ads will be taken. Swap Shop is open to JSC federal and on-site contractor employees for non-commercial personal ads.

Property & Rentals

For lease: Waterfront condo on CL, 2-1-2, beautifully redecorated, tennis courts, marina w/slips available. Call 482-7156 or 480-5583.

For lease: El Dorado Trace condo, 2-1, all appliances, security system, pool/clubhouse, covered parking, \$375/mo. Call 937-7606 after 6 p.m.

For rent: Bayshore townhouse, 3-1 1/2-1, central A/H, carpet, refrig., range, \$475/mo. incl. gas/water plus deposit. Call 946-3857.

For lease: 10 acres Alvin area, fenced, on paved road, horses, cattle. Call Damewood, 482-5572.

For lease: Heritage Park, new sec., 3-2-2, formal dining, fence, fireplace, high ceiling, microwave, refrig., clean, \$550/mo. Call 482-6609.

For lease: Oakbrook townhouse, CLC, 2-2 1/2-2, fireplace, W/D, custom drapes. Call Actkinson, x6451 or 482-7061.

For lease: CLC, Baywind II, fireplace, 1 BR, W/D connection, new drapes, paint & carpet, \$380/mo. Call Mr. Mason, x5457 or 333-4144.

For lease: Pasadena, 3-1-1, fenced, central A/H, recarpeted & painted, closet space, no pets, \$425 + deposit. Call Donna, x4571 or 479-8562 after 5 p.m.

For lease: Seabrook Miramar, 5-2-2, fireplace, drapes, appliances, W/D, fenced, no pets, \$675/mo., first & last + deposit, 1 yr. lease. Call David, 476-8076 or 479-8562 after 5 p.m.

For rent: Galveston-by-the-Sea condo, 2 BR, furnished, for rent by day (2 minimum), week or month. Call Clements, 474-2622.

For rent: Lake Tahoe condo, 2 BR, 2 bath, sleeps 6, Apr. 21-28. Call Chuck, 333-2030, x278, or 486-4534.

For rent: Galveston gulf-front condo, completely furnished, 2 days to 1 mo., low rates. Call Nussman, 488-7762.

For rent: Keystone, Colorado condo, sleeps 4+, fireplace, heated pool, snowmobiles, sleigh rides, tennis, skating, shops. Call Carolyn, x3791 or 480-9102.

For lease/sale: Heritage Park, house, 3-2-2, fenced yard, \$500/mo. + security dep. \$400. Call L. T. Quinn, x4326, or 481-0289.

For sale/lease: El Dorado Trace condo, 2 BR, 2 full baths, W/D, ref., fpl, sale \$45,950 easy assumption, lease \$495/mo. + deposit. Call 482-8457.

For sale: Dickinson 3-2-2, large fenced lot w/trees, brick exterior, new roof, carpeted, central heat/air, mid-40s. Call Harold, x2855 or 337-2679.

For sale: Dickinson 3-2-2, fenced, pool, quiet street, must see to appreciate. Call 534-6388 after 5 p.m.

For sale: Brookforest house, 4BR/2.5 bath, formal dining/living rooms, large family room, heated pool, landscaped, vegetable garden. Call 280-8716 after 5 p.m.

For sale: 30 acres w/2BR house, south of Lake Livingston, large den w/fireplace, wooded, fenced, spring fed creek, \$85,000. Call 488-4915.

For sale: 2.26 acres 2 mi. south of Texas A&M campus in Quail Run Estates. Call 482-3754.

For sale: League City, 68' x 170' lot, all utilities, near high school, \$8,500, terms. Call 1-585-8162.

For sale: CLC, Baywind II, fireplace, 1 BR, W/D connection, new drapes, paint & carpet, \$34,000. Call Mr. Mason, x5457 or 333-4144.

For sale: Interval ownership condo w/deed at Waldon on Lake Conroe. Worldwide exchange privileges, 2 weeks, \$5,000/week or trade for equity. Call 488-7322.

1981 Honda Civic 4-dr. sedan, 5 spd, A/C, stereo/tape, excellent cond., \$4,700. Call Ramon, 486-7335 or 480-3215.

1978 Gran Prix, stereo, cruise, tilt, power windows/locks/trunk, new tires, honeycomb mags, asking \$3,000. Call Rick, x5266 or 480-5911 after 6 p.m.

1971 Renault R-16, 4-speed, AC/AM/FM, sun roof, front wheel drive, 35 mpg, \$425. Call Les, x3681.

1980 Citation, 2-door hatchback, PS/PB/AM/FM radio, air, good condition, \$2,900. Call 333-3735 after 5 p.m.

1978 Subaru, 2-door, 5-speed, full tinted windows, good condition, \$2,000. Call 482-6272.

1979 Caprice Classic Chevrolet, 4-door, grey/black trim, fully equipped, 62K mi., \$4,000. Call 333-2765.

1976 Ford Torino, looks good, many parts replaced, mechanically sound, \$850 or make offer. Call 332-4732.

1977 Monza, 87K mi., good work car, asking \$1,000 or best offer. Call Billie, 480-8800, or 482-4365 evenings.

1975 Chevrolet pickup w/small camper. Call Steve, 488-1366.

1970 VW Type-2 bus, very good body & interior, hardly any rust, recently overhauled engine, \$1,500. Call Hannigan, 337-7082.

1981 Eldorado Custom Cadillac, black w/golden tan all-leather interior, matching vinyl Landau roof, CB, extras, 35K mi., immaculate. Call 474-7769.

1977 Chevrolet Monte Carlo, 305-V8, good condition, new tires, \$1,950. Call 482-1535 evenings & weekend.

1977 Pontiac Firebird, new tires & battery, PS/PB, tape deck, excellent condition, clean, \$3,200. Call 482-7546.

1974 Plymouth Valiant, AC/PS, radio, 79K mi., \$750; 1976 Datsun B210, needs body work, \$500. Call Jim, x3151.

1979 Toyota Celica, 5-speed, sunroof, AC/AM/FM stereo, new tires, new clutch, excellent cond., \$3,800. Call Becky, x6158 or x6159.

1975 Alfa Romeo Spider, 75K mi., needs work, \$2,000 or best offer. Call Tom, x2885 (2nd shift) or 480-9577 days.

Boats & Planes

For rent: Piper Lance, 6-place, 160 knots, full IFR, club seating, \$85/hr. wet. Call L. Damewood or H&R Aviation, 471-1675.

Searay 22' Cuddy Cabin, 190-OMC, SS-prop, power tilt/trim, captains chair, loaded, tandem trailer, elec. winch, \$10,800. Call Sterling, x4524 or 486-4364.

Wellcraft V-20 Steplift, 1982, 470 Merc cruiser, Sportsman drive-on trailer, always in dry storage, \$10,500. Call 464-1981 days, 496-1816 evenings.

Quachita 17' aluminum canoe, square stern, \$225. Call John, x4393 or 488-0559.

Aircraft rentals: C-150 for \$32/hr.; Citabria, fully aerobatic, \$37/hr.; Saratoga, A/C, IFR, retract, 6 pass., \$95/hr. Call Kate Ashe, 482-1179.

Pilot's license: Plan A 25 hrs. solo, 20 hrs. dual, books, supplies, ground school, \$1,750. Call Kate Ashe at 482-1179.

Cycles

Honda CB500 CX turbo, 3,100 mi., perfect cond., gorgeous, \$2,700. Call Dave, x5156 daytime.

Moped, red, buddy seat, 1979 Motobecane, like new, less than 300 mi., foot rests, \$300. Call 946-4013.

Lost

Set of car keys lost on Bldg. 36 parking lot on Feb. 10. Call Lisa, x2591.



People Helping People
The United Way

Audiovisual & Computers

65-watt amplifier, \$290; Nikko top-of-line preamp, \$300; sell pair for \$500 or best offer. Call 486-0958.

Calculator, Sinclair programmable w/AC adapter, case, operating instructions, extensive manufacturer's program library, \$25. Call 488-0003.

Ten 5-1/4" SS/DD soft sectored diskettes, new, \$18. Call Lee, x3431 or 486-0385.

ALSPA 8" 64K CP/M system with teletext 910+ CRT terminal, \$1,700. Call Mike Thomas, 333-3012, or x3071.

Sinclair ZX81 computer, 16K memory, software, D-Ktronics keyboard, all for \$175. Call Lou, x5491.

Novation D-CAT modem w/RS232

cable, LN, \$150. Call 538-2110.

Persons interested in helping to form or joining a local IBM PC Users group, contact Earl Rubenstein, x3501 or 334-2354.

Photography

Minolta SRT 101, 55 mm lens, UV filter, collapsible hood, camera case, \$90 or best offer. Call 554-7226 after 5:30 p.m.

Lens, Osawa, Minolta mount, f3.5, macro, 28-80 mm zoom, multicoated, 62 mm accessories, UV filter, caps & case, \$160. Call 488-0003

Musical Instruments

Coronet, Conn student, some dents, \$40; trumpet, Yamaha student, good condition, \$90. Call 474-4574.

Bundy clarinet w/case & stand, excellent cond., used 4 mo., \$200 or best offer. Call Marie, x3606 or 488-2870 after 5 p.m.

Banjo, 5-string lida, case, instruction books, accessories, excellent cond., \$119. Call 333-2549.

Household

Philippine papasan chair, 50" diameter, very good condition, \$150. Call 538-2110.

Office-at-Home Executive desk, 3 legal-size file compartments, T/W ext. wing, organizer top w/shelves, bur-lap-cov. back panel, pecan burl finish. Call 474-7769.

Dining table/6 chairs, new, \$150; 3-sec. sofa, \$150; barbecue grill, \$25; weight bench \$40; trade for refrigerator or bikes. Call 482-6609.

Small drop-leaf antique dining table, flame birch, country style, \$175. Call 559-1286 after 4 p.m.

Antique couch, \$100; chair, \$50; couch is one of first hide-a-beds made. Call 643-8944.

Coffee table, inlaid beveled glass, (cost \$300) \$50; French table, \$60; 2 bar stools, \$25 for both. Call 488-5564.

Sears washer/dryer, work perfectly, \$150; Sears 17 cu. ft. refrigerator/freezer, \$300; 2 double beds w/mattress/box springs, \$100 each; 8' sofa multicolored, \$50. Call 554-4133 after 5 p.m.

Sofa, 100", stuffed black naugahyde, \$100; two 26" square and one 24" hexagonal end tables, walnut, traditional, \$50 each. Call Paul, x2989 or 488-1028 after 5 p.m.

Rattan Bentwood rocker, \$50; hanging chair, \$75, colonial dresser, \$50; French provincial chest, \$40; other items. Call Nancy, x4568 or 538-2047.

Sofa day bed, \$75; marbletop table, \$35; coffee table, \$50; breakfast table w/two leatherette/chrome chairs, \$55. Call 488-5564.

Pets

Beagle, 11 mo. old, AKC registerable, had all shots, needs home w/children. Call Betty, x5111 or 334-6821.

Cocker spaniel, registered, buff, 5-yrs. old, female. Call Sam, x3869 or 409-297-5502.

Two female AKC cocker spaniels, 1 1/2-years, one brown, one black, gentle, must go as set, free to good home. Call Joyce, x5293.

Miscellaneous

Cage-type 50' CB antenna with guy wires, still on roof, you remove, \$75 or trade for equal value. Call M. Ellison, x2048.

Problem controlling your eating? Overeaters Anonymous, no dues, no fees. Gilruth Center, Wednesdays, 11:30 a.m. Call Cecilia, 339-1082, or Gil, x3701.

Continental Airlines round-trip companion ticket to Denver, good Apr. 1-May 31, \$100. Call Doris Wood, x3216, x5263 or 333-2373 after 5 p.m.

Kreepy-Crauly pool cleaner used less than one year, half price, \$300. Call Mike Thomas, 333-3012 or x3071.

9-inch table saw, Sears Best, extra carbide blade, plywood blade & sanding disc, \$225. Call Don Halter, x3231 or 488-0588.

Large Collection of beautiful seashells, seeing is believing, \$275. Call Theo Merkes, x7236

Car telephone, VHF Aerotron 600 with Glenair 2000 head, complete w/cable, cost \$4,000 in 1980, selling for \$850. Call 474-2906.

Airvent constructed aluminum back porch structure incl. screens, plastic windows, storm door, make bid. Call Briggs, x5165.

One brown chinchilla rabbit, female, unbred, with large outdoor, single-pen cage, \$15. Call H.S. Ream, x3570 or 538-3069 after 6 p.m.

Smith-Corona business electric typewriter, \$120; large folding table, wood top; 2-speed 24" fan, swivel stand, \$30; 100 Natl. Geographics, \$30; Call 488-5564.

Tires, four, FR78-15, Goodyear steel-belted radials mounted on Chevrolet wheels, \$90. Call 488-0003.

Bell full-face motorcycle helmet, bright orange, excellent condition, \$75. Call Marie, x3606 or 488-2870 after 5 p.m.

Coleman Camper, excellent like-new condition, \$2,500. Call 482-7546.

Clear Lake High School yearbooks '78, '79, '80; also '81 TAMU yearbook, \$3 each. Call John, x4393 or 488-0559. 30 concrete blocks, \$15. Call Lattier, x5561 or 486-4002.

Tennis rackets, Dunlop McEnroe unstrung, new, \$25; strung, new, \$35; Wilson Advantage, strung, used, \$30. Call John Lo, x4107 or 482-8457.

Approximately 100 feet of 6' cedar fence, 2 1/2 years old, in sections, gate included, stacked, ready-to-move, make offer. Call M. Ellison, x2048.

Approximately 125 feet galvanized chain link fencing with one walk gate, \$65. Call 534-2626 after 5 p.m.

40' aluminum extension ladder; Sears ratchet rowing machine; bicycle exercise stand; all excellent. Call 488-3819. Skis, 150 cm. \$20; 2 pair men's ski boots, size 10 1/2. Call 474-3489 after 5 p.m. Ski boots, lady's size 5-6, \$40 or trade for men's size 8-9. Call 538-2082.

Wanted

One black leopard skin with head

intact. Call Harold S. Ream, x3570, or 538-3069 after 6 p.m.

Memorabilia from Star Trek, Beatles & Police; fair price according to condition. Call H.S. Ream, x3570, or 538-3069 after 6 p.m.

Roommate to share Middlebrook 3-2-2, non-smoker, no pets, \$285 + 1/2 utilities. Call Jim, x5378.

Baby high chair, good condition. Call Elaine, 488-3433 after 4:30 p.m.

One or two roommates to share large house, 15 minutes from NASA, non-smoker preferred, \$183/mo. + utilities. Call Dan, 333-6457 or 996-9837 after 5 p.m.

Trailer hitch to fit 1980 Ford E250 van. Call 482-9116.

Male roommate to share 2-2 condo w/husband & wife, no lease, \$300 + deposit, all utilities incl. Call Rick, 480-8223 or x5341.

Bicycle for 5-year-old boy, working or not. Call Bill Young, x4164.

Electric trains. Call Don, x2449. Molded infant bike seat with wheel/spoke guards. Call Georgia, x5195 or 482-0044 after 5 p.m.

Carpools

Ride needed from Pasadena to NASA, 7 a.m. to 3:30 p.m., will pay for gas. Call Mary Cunningham, x2634 or 475-1992.

Want to join/form carpool from I45 North between Greenspoint & North Line area, 7:30 a.m. to 4 p.m. shift. Call Debra, x3188 or 931-1651.

Carpool member wanted from West University/Med. Ctr. area to JSC, non-smoker, 7:50 a.m. to 4:20 p.m. Call Mike, x2688, or Charles, x4901.

Gilruth Center News

Call x3594 for more information

Athletic injuries — A lecture on injuries in exercise and athletics will be offered by the Rec Center from 6:30 to 8 p.m., March 19. For more information, call x3594.

SCUBA — The latest NAUI-certified SCUBA course begins March 19 with classes from 6:30 to 9 p.m., Tuesdays, and pool sessions beginning at 7:30 p.m. Wednesdays.

Garage sale — The Rec Center's annual garage sale will be held from 1 to 6 p.m. April 1, with tables available for NASA and contractor employees for \$2. You must make table reservations in advance and space is limited.

Softball registration — The 1984 softball season at JSC begins March 19, and registration is underway through March 15. First come, first served.

Aerobic dance — This class features a vigorous workout set to music and will meet from 4:15 to 5:15 Mondays and Wednesdays and from 7 to 8 p.m. Tuesdays and Thursdays, beginning March 26. The cost for this eight-week course is \$55 per person.

Yoga — This class can help you improve your health and promote your own sense of well being. The class begins March 20 and meets from 7 to 8 p.m. The cost of this Tuesday class is \$24 per person.

Race — The next Rec Center race is the Space Shuttle 1/2 or 1/4 Marathon, to be held beginning at 8 a.m., March 31. T-shirts will go to the first 500 entrants, and the cost of early registration is \$5.

Defensive driving — Learn to drive safely and qualify for a 10 percent reduction in your insurance for the next three years. This class will meet from 8 a.m. to 5 p.m., April 21, at a cost of \$21 per person.

Plumbing repair — This course is designed for people tired of high plumbing bills for minor repairs. The one-night seminar meets from 7:15 to 10:15 p.m., March 26. The cost is \$20 per person, all books and materials included.

Electrical repair — The emphasis is on simple repairs and safety in this class which meets from 7:15 to 10:15 p.m. March 28. The cost is \$20 per person, all books and materials included.

Cookin' in the Cafeteria

Week of February 27 - March 2, 1984

Week of March 5 - 9, 1984

Monday: Cream of Celery Soup; Braised Beef Ribs, Chicken a la King, Enchiladas w/Chili, Italian Cutlet (Special); Navy Beans, Brussels Sprouts, Whipped Potatoes. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

Tuesday: Beef & Barley Soup; Turkey & Dressing, Country Style Steak, Stuffed Cabbage (Special); Corn Cobbette, Okra & Tomatoes, French Beans.

Wednesday: Seafood Gumbo; Catfish w/Hush Puppies, Roast Pork w/Dressing, Chinese Pepper Steak (Special); Broccoli, Macaroni & Cheese, Stewed Tomatoes.

Thursday: Cream of Tomato Soup; Beef Tacos, BBQ Ham Slice, Hungarian Goulash, Chicken Fried Steak (Special); Spinach, Pinto Beans, Beets.

Friday: Seafood Gumbo; Liver & Onions, Deviled Crabs, Roast Beef w/Dressing, Tuna & Noodle Casserole (Special); Whipped Potatoes, Peas, Cauliflower.

Monday: French Onion Soup; Beef Chop Suey, Polish Sausage w/German Potato Salad, Breaded Veal Cutlet (Special); Okra & Tomatoes, Green Peas. Standard Daily Items: Roast Beef, Baked Ham, Fried Chicken, Fried Fish, Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

Tuesday: Split Pea Soup; Salisbury Steak, Shrimp Creole, Fried Chicken (Special); Mixed Vegetables, Beets, Whipped Potatoes.

Wednesday: Seafood Gumbo; Fried Catfish w/Hush Puppies, Braised Beef Ribs, BBQ Plate, Weiners & Beans, Shrimp Salad, Stuffed Bell Pepper (Special); Corn O'Brian, Rice, Italian Green Beans.

Thursday: Chicken Noodle Soup; Beef Stroganoff, Turkey & Dressing, BBQ Smoked Link (Special); Lima Beans, Buttered Squash, Spanish Rice.

Friday: Seafood Gumbo; Broiled Turbot, Liver & Onions, Fried Shrimp, Meat Sauce & Spaghetti (Special); Green Beans, Buttered Broccoli, Whipped Potatoes.